THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Masahiro TOJO et al.

Serial No.: 10/593,770

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For : PROCESS FOR PRODUCING AN AROMATIC CARBONATE

Art Unit : 1626

Examiner : Matthew P. Coughlin

DECLARATION

I, Masahiro TOJO, a Japanese citizen residing at 1005-1, Higashi-tomii, Kurashiki-shi, Okayama-ken, Japan, hereby declare and state:

I took a master course majoring in chemistry at Graduate School of Science, Kyoto University, Japan, and I was graduated therefrom in March 1980.

I entered Asahi Kasei Kabushiki Kaisha in April 1980. Since then, I have been engaged in the research and development of raw materials for synthetic resins.

I am one of the applicants of the above-identified ap-

plication and I am well familiar with the present case.

I have read and understood the Office Action dated December 17, 2009 and the references cited therein.

I carried out Examples 1-8 and Comparative Examples 1-3 of the present application, and the results are as described at pages 52-64 of the present specification.

I have made observations to show, with reference to Examples 5-8 and Comparative Example 3 of the present application, that the production of an aromatic polycarbonate having a high molecular weight at a high polymerization rate can for the first time be achieved by the use of the aromatic carbonate obtained by the process of the present invention. The method and results are as described in a paper attached hereto and marked "Exhibit 1".

From the results of Exhibit 1, it can be fairly concluded:

(1) that, in each of Examples 5-8 of the present application, an aromatic polycarbonate having a number average molecular weight as high as 9,500 or more is produced at a polymerization rate as high as 3,167 per hour or more by virtue of the use of an aromatic carbonate which is obtained by the process of the present invention and which has an aromatic carbonate

ether (b) content as low as 5 ppm by weight or less;

(2) that, on the other hand, in Comparative Example 3 of the present application, an aromatic polycarbonate having a number average molecular weight as low as 7,500 is produced at a polymerization rate as low as 2,500 per hour due to the use of an aromatic carbonate which is obtained by a conventional process and which has an aromatic carbonate ether (b) content as high as 67 ppm by weight; and

(3) that, therefore, the production of an aromatic polycarbonate having a high molecular weight at a high polymerization rate can for the first time be achieved by the use of the aromatic carbonate obtained by the process of the present invention.

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Feb. 22, 2010

Date

Masahiro Tojo

Masahiro TOJO

Exhibit 1

Observations to show that the production of an aromatic polycarbonate having a high molecular weight at a high polymerization rate can for the first time be achieved by the use of the aromatic carbonate obtained by the process of the present invention

1. Object of observations

The object of the observations is to show, with reference to Examples 5-8 and Comparative Example 3 of the present application, that the production of an aromatic polycarbonate having a high molecular weight at a high polymerization rate can for the first time be achieved by the use of the aromatic carbonate obtained by the process of the present invention.

2. Observations

In Example 5 (see page 62, line 13 to page 63, line 6 of the present specification), an aromatic polycarbonate is produced using the aromatic carbonate obtained in Example 2, which is a diphenyl carbonate containing substantially no aromatic carbonate ether ($CH_3OCH_2CH_2OCOOPh$) as the aromatic carbonate ether (b) (since the aromatic carbonate ether (b) is not detected in the diphenyl carbonate and, hence, the content of the aromatic carbonate ether (b) in the diphenyl

carbonate is considered to be 0 ppm by weight).

In Example 5, the polymerization reaction for producing the aromatic polycarbonate is performed as follows:

> "The temperature of the resultant mixture was slowly elevated from 180 to 220 °C while stirring and purging the atmosphere of the reactor with nitrogen gas. Subsequently, the reactor was hermetically sealed, and a polymerization was effected under 8,000 Pa for 30 minutes while stirring at 100 rpm and, then, under 4,000 Pa for 90 minutes while stirring at 100 rpm. Thereafter, the temperature of the reactor was elevated to 270 °C, and a polymerization was effected under 70 Pa for 1 hour, thereby obtaining an aromatic polycarbonate." (emphasis added) (see page 62, line 18 to page 63, line 3 of the present specification)

Therefore, the polymerization time is 3 hours in total (30 minutes + 90 minutes + 1 hour = 3 hours).

The aromatic polycarbonate produced in Example 5 has a number average molecular weight of 11,500. Thus, the polymerization rate is 3,833 (= 11,500/3) per hour, wherein the polymerization rate is defined as the value obtained by dividing the number average molecular weight of the aromatic polycarbonate by the polymerization time.

In Example 6 (see page 63, lines 17-25 of the present specification), an aromatic polycarbonate is produced using the aromatic carbonate obtained in Example 3, which is a di-

phenyl carbonate containing the aromatic carbonate ether ($CH_3OCH_2CH_2OCOOPh$) as the aromatic carbonate ether (b) in an amount of 1 ppm by weight.

In Example 6, the polymerization for producing the aromatic polycarbonate is performed in substantially the same manner as in Example 5, except that the aromatic carbonate obtained in Example 3 is used in place of the aromatic carbonate obtained in Example 2. Therefore, the polymerization time in Example 6 is 3 hours in total.

The aromatic polycarbonate produced in Example 6 has a number average molecular weight of 11,000. Thus, the polymerization rate is 3,667(= 11,000/3) per hour.

In Example 7 (see page 64, lines 2-10 of the present specification), an aromatic polycarbonate is produced using the aromatic carbonate obtained in Example 4, which is a diphenyl carbonate containing the aromatic carbonate ether ($CH_3OCH_2CH_2OCOOPh$) as the aromatic carbonate ether (b) in an amount of 2.5 ppm by weight.

In Example 7, the polymerization for producing the aromatic polycarbonate is performed in substantially the same manner as in Example 5, except that the aromatic carbonate obtained in Example 4 is used in place of the aromatic carbonate obtained in Example 2. Therefore, the polymerization

time in Example 7 is 3 hours in total.

The aromatic polycarbonate produced in Example 7 has a number average molecular weight of 10,500. Thus, the polymerization rate is 3,500 (= 10,500/3) per hour.

In Example 8 (see page 64, lines 12-20 of the present specification), an aromatic polycarbonate is produced using the aromatic carbonate obtained in Example 1, which is a diphenyl carbonate containing the aromatic carbonate ether ($CH_3OCH_2CH_2OCOOPh$) as the aromatic carbonate ether (b) in an amount of 5 ppm by weight.

In Example 8, the polymerization for producing the aromatic polycarbonate is performed in substantially the same manner as in Example 5, except that the aromatic carbonate obtained in Example 1 is used in place of the aromatic carbonate obtained in Example 2. Therefore, the polymerization time in Example 8 is 3 hours in total.

The aromatic polycarbonate produced in Example 8 has a number average molecular weight of 9,500. Thus, the polymerization rate is 3,167 (= 9,500/3) per hour.

In Comparative Example 3 (see page 63, lines 8-15 of the present specification), an aromatic polycarbonate is produced using the aromatic carbonate obtained in Comparative Example 2, which is a diphenyl carbonate containing the aromatic car-

bonate ether ($CH_3OCH_2CH_2OCOOPh$) as the aromatic carbonate ether (b) in an amount of 67 ppm by weight.

In Comparative Example 3, the polymerization for producing the aromatic polycarbonate is performed in substantially the same manner as in Example 5, except that the aromatic carbonate obtained in Comparative Example 2 is used in place of the aromatic carbonate obtained in Example 2. Therefore, the polymerization time in Comparative Example 3 is 3 hours in total.

The aromatic polycarbonate produced in Comparative Example 3 has a number average molecular weight of 7,500. Thus, the polymerization rate is 2,500 (= 7,500/3) per hour.

From the results of Examples 5-8 and Comparative Example 3 of the present application, the following Table A is obtained:

Table A

	Content of the aromatic carbonate ether (b) in the aromatic carbonate (ppm by weight)	Number average molecular weight of the aromatic polycarbonate	Polymerization rate (per hour)
Example 5	0	11,500	3,833
Example 6	1	11,000	3,667
Example 7	2.5	10,500	3,500
Example 8	5	9,500	3,167
Comparative Example 3	67	7,500	2,500

Referring to Table A above, observations are made below.

In each of Examples 5-8 of the present application, an aromatic polycarbonate having a number average molecular weight as high as 9,500 or more is produced at a polymerization rate as high as 3,167 per hour or more by virtue of the use of an aromatic carbonate which is obtained by the process of the present invention and which has an aromatic carbonate ether (b) content as low as 5 ppm by weight or less.

On the other hand, in Comparative Example 3 of the present application, an aromatic polycarbonate having a number average molecular weight as low as 7,500 is produced at a polymerization rate as low as 2,500 per hour due to the use of an aromatic carbonate which is obtained by a conventional process and which has an aromatic carbonate ether (b) content as high as 67 ppm by weight.

Therefore, the production of an aromatic polycarbonate having a high molecular weight at a high polymerization rate can for the first time be achieved by the use of the aromatic carbonate obtained by the process of the present invention.

3. Conclusion

From the observations, it can be fairly concluded:

(1) that, in each of Examples 5-8 of the present application, an aromatic polycarbonate having a number average molecular weight as high as 9,500 or more is produced at a polymerization rate as high as 3,167 per hour or more by virtue of the use of an aromatic carbonate which is obtained by the process of the present invention and which has an aromatic carbonate ether (b) content as low as 5 ppm by weight or less;

(2) that, on the other hand, in Comparative Example 3 of the present application, an aromatic polycarbonate having a number average molecular weight as low as 7,500 is produced at a polymerization rate as low as 2,500 per hour due to the use of an aromatic carbonate which is obtained by a conventional process and which has an aromatic carbonate ether (b) content as high as 67 ppm by weight; and

(3) that, therefore, the production of an aromatic polycarbonate having a high molecular weight at a high polymerization rate can for the first time be achieved by the use of the aromatic carbonate obtained by the process of the present invention.